



EMC TEST REPORT

Applicant Huawei Technologies Co., Ltd.
FCC ID QISBAH2-W19
Product Tablet
Model BAH2-W19
Report No. R1806H0070-E1
Issue Date July 5, 2018

TA Technology (Shanghai) Co., Ltd. tested the above equipment in accordance with the requirements in **FCC Code CFR47 Part15B (2017)/ ANSI C63.4 (2014)**. The test results show that the equipment tested is capable of demonstrating compliance with the requirements as documented in this report.

Wei Liu

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Summary of measurement results

Number	Test Case	Clause in FCC Rules	Conclusion
1	Radiated Emission	15.109, ANSI C63.4-2014	PASS
2	Conducted Emission	15.107, ANSI C63.4-2014	PASS
Test Date: June 27, 2018~ July 3, 2018			

1 Test Laboratory

1.1 Notes of the Test Report

This report shall not be reproduced in full or partial, without the written approval of **TA technology (shanghai) co., Ltd.** The results documented in this report apply only to the tested sample, under the conditions and modes of operation as described herein. Measurement Uncertainties were not taken into account and are published for informational purposes only. This report is written to support regulatory compliance of the applicable standards stated above.

1.2 Test facility

CNAS (accreditation number: L2264)

TA Technology (Shanghai) Co., Ltd. has obtained the accreditation of China National Accreditation Service for Conformity Assessment (CNAS).

FCC (Designation number: CN1179, Test Firm Registration Number: 446626)

TA Technology (Shanghai) Co., Ltd. has been listed on the US Federal Communications Commission list of test facilities recognized to perform electromagnetic emissions measurements.

IC (recognition number is 8510A)

TA Technology (Shanghai) Co., Ltd. has been listed by industry Canada to perform electromagnetic emission measurement.

VCCI (recognition number is C-4595, T-2154, R-4113, G-10766)

TA Technology (Shanghai) Co., Ltd. has been listed by industry Japan to perform electromagnetic emission measurement.

A2LA (Certificate Number: 3857.01)

TA Technology (Shanghai) Co., Ltd. has been listed by American Association for Laboratory Accreditation to perform electromagnetic emission measurement.



1.3 Testing Location

Company: TA Technology (Shanghai) Co., Ltd.
Address: No.145, Jintang Rd, Tangzhen Industry Park, Pudong Shanghai, China
City: Shanghai
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Fax: +86-021-50791141/2/3-8000
Website: <http://www.ta-shanghai.com>
E-mail: xukai@ta-shanghai.com

2 General Description of Equipment under Test

2.1 Client Information

Applicant	Huawei Technologies Co., Ltd.
Applicant address	Administration Building, Headquarters of Huawei Technologies Co., Ltd., Bantian, Longgang District, Shenzhen, 518129, P.R.China.
Manufacturer	Huawei Technologies Co., Ltd.
Manufacturer address	Administration Building, Headquarters of Huawei Technologies Co., Ltd., Bantian, Longgang District, Shenzhen, 518129, P.R.China.

2.2 General information

EUT Description			
Device Type:	Portable Device		
Model Number:	BAH2-W19		
SN:	18052675749		
HW Version:	SH0BAH2LM		
SW Version:	BAH2-W19 8.0.0.10(C605)		
Antenna Type:	Internal Antenna		
Frequency:		TX:	RX:
	Bluetooth:	2400MHz ~ 2483.5MHz	2400MHz ~ 2483.5MHz
	WIFI 2.4G:	2400MHz ~ 2483.5MHz	2400MHz ~ 2483.5MHz
	WIFI 5G(U-NII-1):	5150MHz ~ 5250MHz	5150MHz ~ 5250MHz
	WIFI 5G(U-NII-2A):	5250MHz ~ 5350MHz	5250MHz ~ 5350MHz
	WIFI 5G(U-NII-2C):	5470MHz ~ 5725MHz	5470MHz ~ 5725MHz
	WIFI 5G(U-NII-3):	5725MHz ~ 5850MHz	5725MHz ~ 5850MHz
Modulation:	Bluetooth: GFSK, $\pi/4$ -DQPSK, 8-DPSK Bluetooth v4.2 LE: GFSK WLAN 802.11b: DSSS WLAN 802.11a/g/n/ac: OFDM		
Test Mode:	Transfer Data Mode		
EUT Accessory			
Adapter 1	Brand: HUAWEI Manufacturer: Salcomp (Shenzhen) Co., Ltd. Model: HW-059200UHQ		
Adapter 2	Brand: HUAWEI		



	Manufacturer: HUIZHOU BYD ELECTRONIC CO.,LTD. Model: HW-059200UHQ
Adapter 3	Brand: HUAWEI Manufacturer: Salcomp (Shenzhen) Co., Ltd. Model: HW-090200UH0
Adapter 4	Brand: HUAWEI Manufacturer: Shenzhen Kuntkey Electric Co., Ltd. Model: HW-090200UH0
Battery 1	Brand: HUAWEI Manufacturer: SCUD (Fujian) Electronics Co., Ltd. Model: HB2994I8ECW
Battery 2	Brand: HUAWEI Manufacturer: SUNWODA Electronic Co., Ltd Model: HB2994I8ECW
Battery 3	Brand: HUAWEI Manufacturer: Huizhou Desay Battery Co., Ltd Model: HB2994I8ECW
USB Cable 1	USB data cable,white,1m
USB Cable 2	USB-A to USB-C Charge Data Cable,1.0m
Auxiliary test equipment	
PC	PC Manufacturer:Microsoft Model: L20170076 (SN : 032324771953)
Note: The information of the EUT is declared by the manufacturer.	

BAH2-W19 has two storage scenarios, with different memory. EMCP Storage Capacity is 3GB+32GB, LPDDR3+EMMC separation Scheme storage capacity is 4GB+64GB. The two storage mode of peripheral circuit has slight change, but does not affect product performance.

The differences about storage scenarios are showed in the following table. Other parts of the Tablet are the same, including the appearance, the antenna, Chipset, Bluetooth mode, Wifi mode, Adapter, Battery, Mainboard, Software and so on.

Model	BAH2-W19	
Storage Scenarios	EMCP	LPDDR3+eMMC
Storage capacity	3GB+32GB	4GB+64GB

2.3 Applied Standards

According to the specifications of the manufacturer, it must comply with the requirements of the following standards:

Test standards

FCC Code CFR47 Part15B (2017)

ANSI C63.4 (2014)

2.4 Test Mode

Test Mode	
Mode 1:	Adapter + USB cable + Camera On +GNSS Rx + MP3 +Idle
Mode 2:	USB Copy(EUT with PC) + USB cable + Camera On + MP3 + GNSS Rx +Idle
Mode 3:	Camera On + MP3 + GNSS Rx +Idle mode

During the test, the preliminary test was performed in all modes (Camera/MP3/GNSS) with all frequency bands (BT/ Wi-Fi), mode 2 (USB Copy + USB cable + Camera On + MP3 + GNSS Rx +Idle) selected as the worst condition. The test data of the worst-case condition was recorded in this report.

3 Test Case Results

3.1 Radiated Emission

Ambient condition

Temperature	Relative humidity	Pressure
24°C~26°C	45%~50%	102.5kPa

Methods of Measurement

The EUT is placed on a non-metallic table 0.8m above the horizontal metal reference ground plane. The distance between EUT and receive antenna should be 3 meters. During the test, the EUT was operating in its typical mode. The test method is according to ANSI C63.4-2014. Sweep the whole frequency band through the range from 30MHz to the 5th harmonic of the carrier. During the test, the height of receive antenna shall be moved from 1 to 4 meters, and the antenna shall be performed under horizontal and vertical polarization. The turn table shall be rotated from 0 to 360 degrees for detecting the maximum of radiated signal level.

The data of cable loss and antenna factor has been calibrated in full testing frequency range before the testing. During the test, the EUT is worked at maximum output power.

Set the spectrum analyzer in the following:

Below 1GHz:

RBW=100 kHz / VBW=300 kHz / Sweep=AUTO

Above 1GHz:

(a) PEAK: RBW=1MHz / VBW=3MHz/ Sweep=AUTO

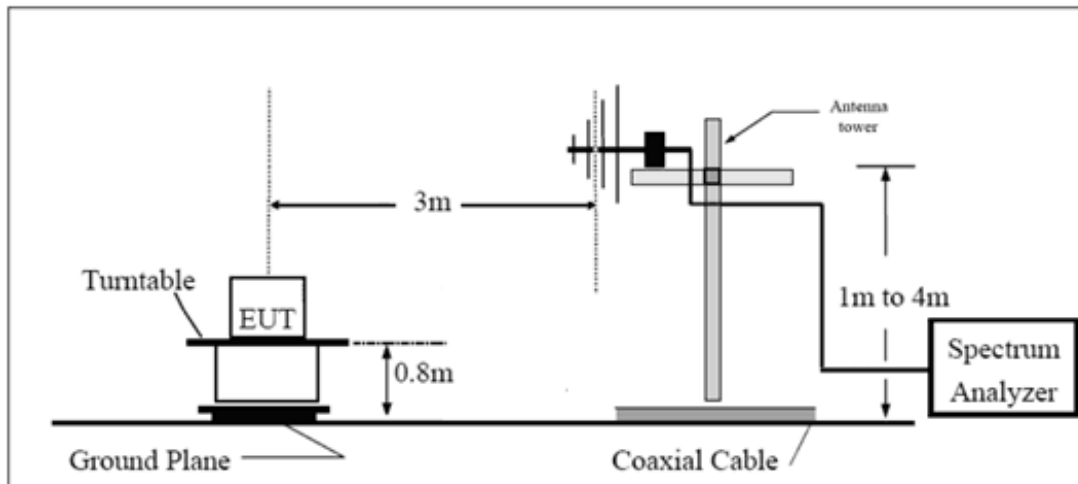
(b) AVERAGE: RBW=1MHz / VBW=1Hz / Sweep=AUTO

The radiated emission was measured in the following position: EUT stand-up position (Z axis), lie-down position (X, Y axis). The worst emission was found in lie-down position (X axis) and the worst case was recorded.

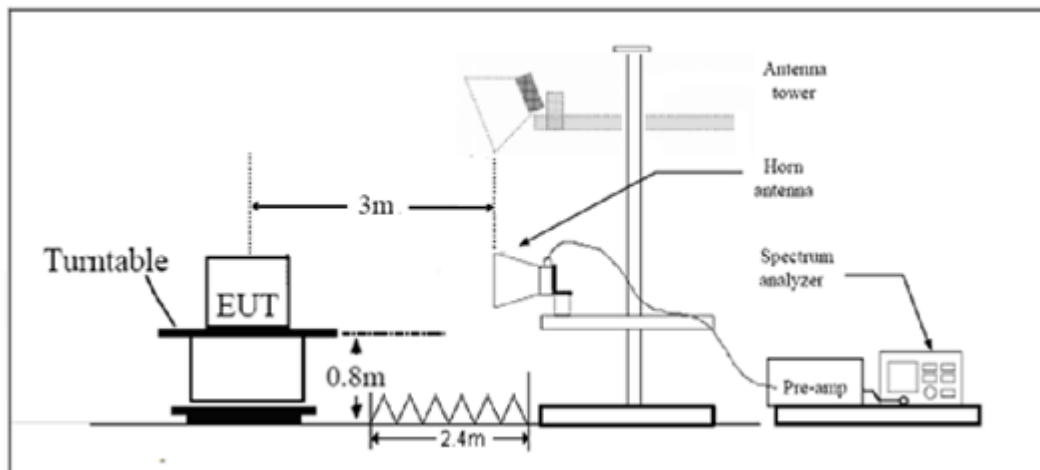
During the test, EUT is connected to a laptop via a USB cable in the case of Transfer Data mode. The EUT is used as the peripheral equipment of the PC. The data is transferred from EUT to PC; PC is connected to server via a long LAN cable.

Test Setup

Below 1GHz



Above 1GHz



Note: Area side:2.4mX3.6m

Antenna Tower meets ANSI C63.4 requirements for measurements above 1 GHz by keeping the antenna aimed at the EUT during the antenna's ascent/ descent along the antenna mast.

Limits

Frequency (MHz)	Field Strength (dB μ V/m)	Detector
30 -88	40.0	Quasi-peak
88-216	43.5	Quasi-peak
216 – 960	46.0	Quasi-peak
960-1000	54.0	Quasi-peak
1000-5 th harmonic of the highest frequency or 40GHz, which is lower	54 74	Average Peak

Measurement Uncertainty

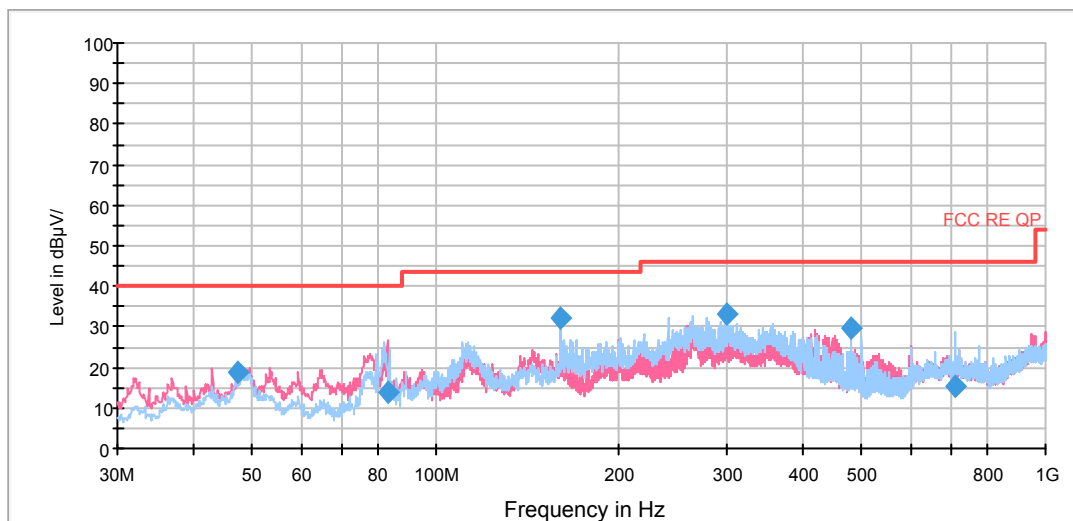
The assessed measurement uncertainty to ensure 95% confidence level for the normal distribution is with the coverage factor $k = 1.96$. $U = 3.704$ dB.

Test Results

The following graphs display the maximum values of horizontal and vertical by software.
For above 1GHz, Blue trace uses the peak detection, Green trace uses the average detection.

4GB+64GB

RE 30M-1GHz QP

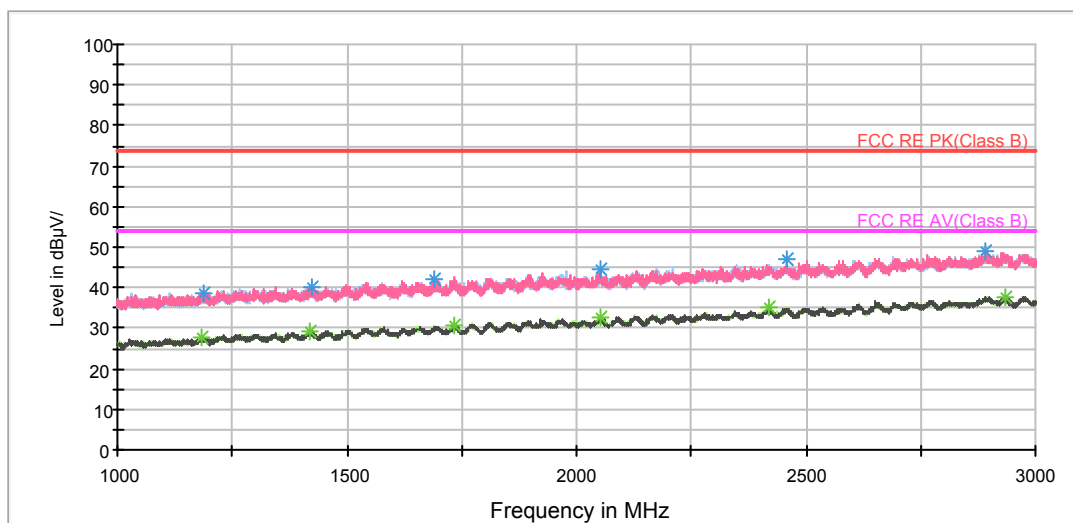


Radiated Emission from 30MHz to 1GHz

Frequency (MHz)	Quasi-Peak (dBuV/m)	Reading value (dBuV/m)	Height (cm)	Polarization	Azimuth (deg)	Correct Factor (dB)	Margin (dB)	Limit (dBuV/m)
47.098510	18.9	36.7	101.0	V	97.0	-17.8	21.1	40.0
83.219731	14.0	39.3	208.0	V	37.0	-25.3	26.0	40.0
159.980050	32.3	60.3	219.0	H	279.0	-28.0	11.2	43.5
298.984250	33.1	55.8	101.0	H	272.0	-22.7	12.9	46.0
479.998750	29.9	49.6	121.0	V	214.0	-19.7	16.1	46.0
712.454750	15.6	30.5	225.0	H	184.0	-14.9	30.4	46.0

Remark: 1. Quasi-Peak = Reading value + Correction factor
2. Correction Factor = Antenna factor+ Insertion loss(cable loss+amplifier gain)
3. Margin = Limit – Quasi-Peak

RE 1G-3GHz PK+AV

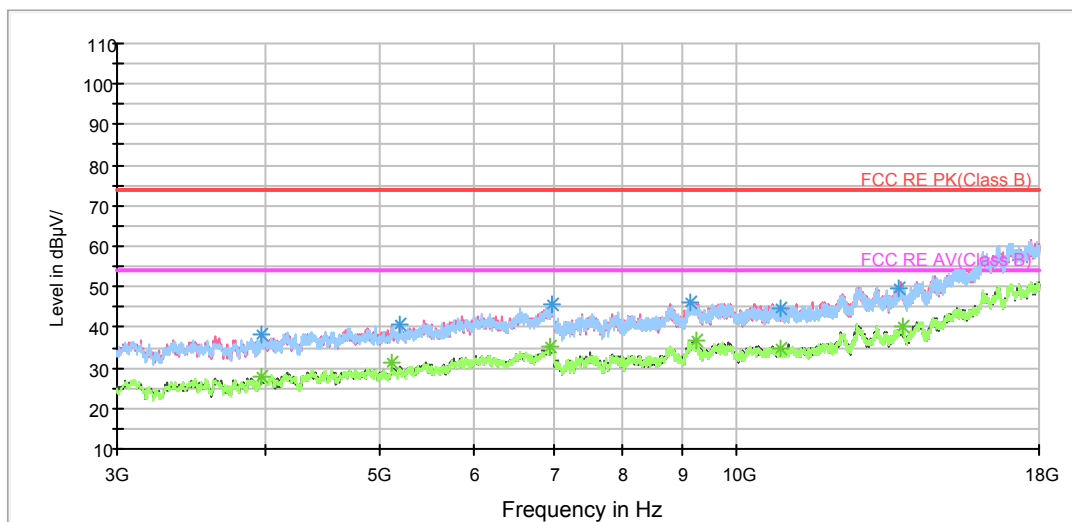


Radiated Emission from 1GHz to 3GHz

Frequency (MHz)	Peak (dBuV/m)	Reading value (dBuV/m)	Height (cm)	Polarization	Azimuth (deg)	Correct Factor (dB)	Margin (dB)	Limit (dBuV/m)
1187.250000	38.7	46.8	100.0	H	281.0	-8.1	35.3	74
1424.250000	40.0	46.9	100.0	H	287.0	-6.9	34.0	74
1690.500000	41.9	46.9	100.0	H	97.0	-5.0	32.1	74
2052.750000	44.4	47.6	100.0	H	320.0	-3.2	29.6	74
2459.250000	47.2	47.7	100.0	V	0.0	-0.5	26.8	74
2891.500000	48.8	46.7	100.0	H	326.0	2.1	25.2	74

Frequency (MHz)	Average (dBuV/m)	Reading value (dBuV/m)	Height (cm)	Polarization	Azimuth (deg)	Correct Factor (dB)	Margin (dB)	Limit (dBuV/m)
1185.250000	27.7	35.8	100.0	V	0.0	-8.1	26.3	54
1419.500000	29.2	36.1	100.0	H	193.0	-6.9	24.8	54
1732.000000	30.7	35.5	100.0	V	299.0	-4.8	23.3	54
2053.500000	32.5	35.7	100.0	V	28.0	-3.2	21.5	54
2421.000000	35.3	35.9	100.0	H	287.0	-0.6	18.7	54
2933.000000	37.7	35.9	100.0	V	92.0	1.8	16.3	54

RE 3-18GHz PK+AV



Radiated Emission from 3GHz to 18GHz

Frequency (MHz)	Peak (dBuV/m)	Reading value (dBuV/m)	Height (cm)	Polarization	Azimuth (deg)	Correct Factor (dB)	Margin (dB)	Limit (dBuV/m)
3978.750000	38.4	39.3	100.0	V	304.0	-0.9	35.6	74
5197.500000	40.8	38.7	100.0	V	348.0	2.1	33.2	74
6975.000000	45.4	39.1	100.0	V	215.0	6.3	28.6	74
9129.375000	46.1	36.1	100.0	H	177.0	10.0	27.9	74
13717.500000	49.5	36.1	100.0	H	12.0	13.4	24.5	74
10875.000000	44.7	34.8	100.0	H	2.0	9.9	29.3	74

Frequency (MHz)	Average (dBuV/m)	Reading value (dBuV/m)	Height (cm)	Polarization	Azimuth (deg)	Correct Factor (dB)	Margin (dB)	Limit (dBuV/m)
3967.500000	27.6	28.5	100.0	V	272.0	-0.9	26.4	54
5113.125000	31.0	29.2	100.0	H	12.0	1.8	23.0	54
6967.500000	35.3	29.0	100.0	V	0.0	6.3	18.7	54
9238.125000	36.8	26.9	100.0	V	0.0	9.9	17.2	54
13792.500000	40.4	26.0	100.0	V	171.0	14.4	13.6	54
10886.250000	34.8	24.9	100.0	V	150.0	9.9	19.2	54

3.2 Conducted Emission

Ambient condition

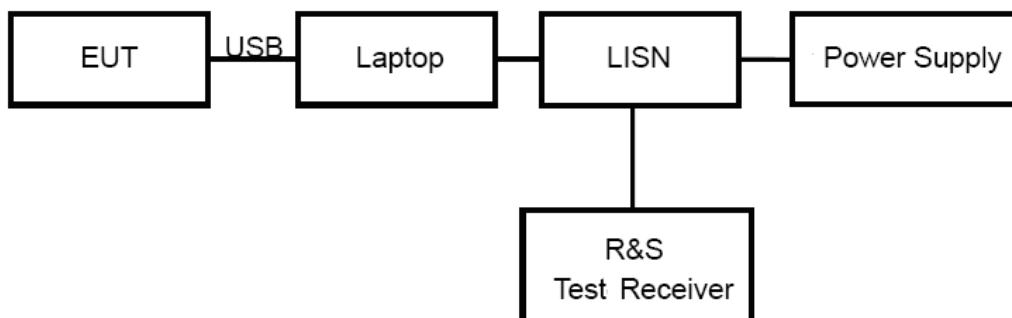
Temperature	Relative humidity	Pressure
24°C ~26°C	50%~55%	102.5kPa

Methods of Measurement

The EUT is placed on a non-metallic table of 80cm height above the horizontal metal reference ground plane. During the test, the EUT was operating in its typical mode. The test method is according to ANSI C63.4-2014. Connect the AC power line of the EUT to the L.I.S.N. Use EMI receiver to detect the average and Quasi-peak value. RBW is set to 9 kHz, VBW is set to 30kHz. The measurement result should include both L line and N line.

During the test, EUT is connected to a laptop via a USB cable in the case of Transfer Data mode. The EUT is used as the peripheral equipment of the PC. The data is transferred from EUT to PC; PC is connected to server via a long LAN cable.

Test Setup



Note: Power Supply is AC Power source and it is used to change the voltage 120V/60Hz.

Limits

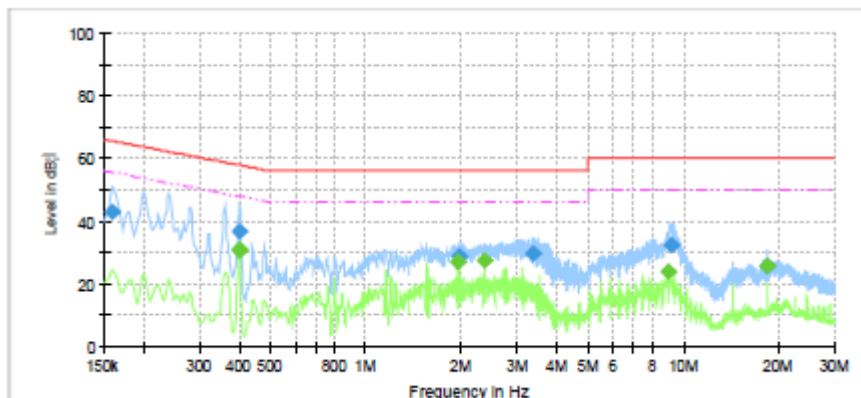
Frequency (MHz)	Conducted Limits(dBμV)	
	Quasi-peak	Average
0.15 - 0.5	66 to 56 *	56 to 46 *
0.5 - 5	56	46
5 - 30	60	50
*: Decreases with the logarithm of the frequency.		

Measurement Uncertainty

The assessed measurement uncertainty to ensure 95% confidence level for the normal distribution is with the coverage factor $k = 1.96$. $U = 2.57$ dB.

Test Results

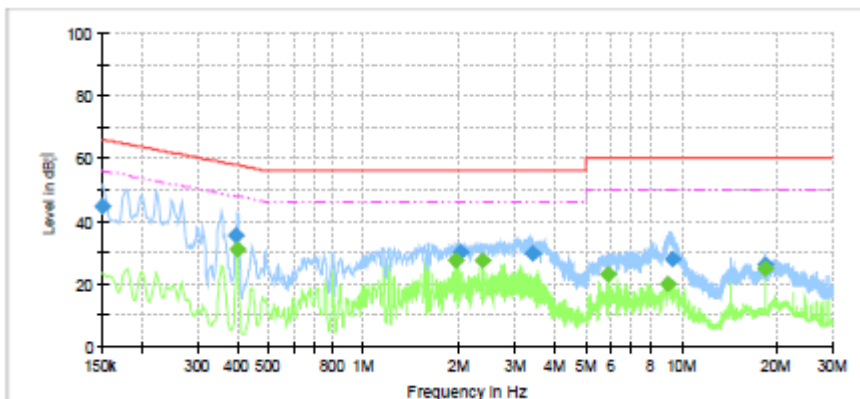
Following plots, Blue trace uses the peak detection; Green trace uses the average detection.



Frequency (MHz)	QuasiPeak (dB μ V)	Average (dB μ V)	Limit (dB μ V)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Line	Filter	Corr. (dB)
0.159000	42.74	—	65.52	22.78	1000.0	9.000	L1	ON	19.1
0.397500	—	30.74	47.91	17.16	1000.0	9.000	L1	ON	19.2
0.397500	36.68	—	57.91	21.23	1000.0	9.000	L1	ON	19.2
0.399750	—	30.80	47.86	17.06	1000.0	9.000	L1	ON	19.2
1.956750	—	26.97	46.00	19.03	1000.0	9.000	L1	ON	19.1
1.961250	28.88	—	56.00	27.12	1000.0	9.000	L1	ON	19.1
2.357250	—	27.53	46.00	18.47	1000.0	9.000	L1	ON	19.0
3.383250	29.62	—	56.00	26.38	1000.0	9.000	L1	ON	19.1
8.994750	—	24.04	50.00	25.96	1000.0	9.000	L1	ON	19.3
9.177000	32.36	—	60.00	27.64	1000.0	9.000	L1	ON	19.3
18.431250	—	25.52	50.00	24.48	1000.0	9.000	L1	ON	19.6
18.433500	25.88	—	60.00	34.12	1000.0	9.000	L1	ON	19.6

L line

Conducted Emission from 150 KHz to 30 MHz



Frequency (MHz)	QuasiPeak (dB μ V)	Average (dB μ V)	Limit (dB μ V)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Line	Filter	Corr. (dB)
0.150000	44.76	—	66.00	21.24	1000.0	9.000	N	ON	19.1
0.395250	35.23	—	57.95	22.72	1000.0	9.000	N	ON	19.2
0.399750	—	30.87	47.86	16.99	1000.0	9.000	N	ON	19.2
1.956750	—	27.35	46.00	18.65	1000.0	9.000	N	ON	19.1
2.004000	30.09	—	56.00	25.91	1000.0	9.000	N	ON	19.1
2.357250	—	27.32	46.00	18.68	1000.0	9.000	N	ON	19.0
3.410250	29.85	—	56.00	26.15	1000.0	9.000	N	ON	19.1
5.871750	—	23.05	50.00	26.95	1000.0	9.000	N	ON	19.1
9.071250	—	19.93	50.00	30.07	1000.0	9.000	N	ON	19.3
9.332250	27.72	—	60.00	32.28	1000.0	9.000	N	ON	19.3
18.431250	26.29	—	60.00	33.71	1000.0	9.000	N	ON	19.4
18.431250	—	24.93	50.00	25.07	1000.0	9.000	N	ON	19.4

N line

Conducted Emission from 150 KHz to 30 MHz

4 Main Test Instrument

Name	Manufacturer	Type	Serial Number	Last Cal.	Cal. Due Date
Signal Analyzer	R&S	FSV30	100815	2017-12-17	2018-12-16
EMI Test Receiver	R&S	ESCI	100948	2018-05-20	2019-05-19
Loop Antenna	SCHWARZBECK	FMZB1519	1519-047	2017-02-18	2019-02-17
Trilog Antenna	SCHWARZBECK	VULB 9163	9163-201	2017-11-18	2020-11-17
Horn Antenna	R&S	HF907	100126	2014-12-06	2019-12-05
Horn Antenna	ETS-Lindgren	3160-09	00102643	2015-01-30	2020-01-29
EMI Test Receiver	R&S	ESR	101667	2017-09-06	2018-09-05
LISN	R&S	ENV216	101171	2016-12-16	2019-12-15
Bore Sight Antenna mast	ETS	2171B	00058752	NA	NA
Test software	EMC32	R&S	V9.26.0	NA	NA

*****END OF REPORT *****